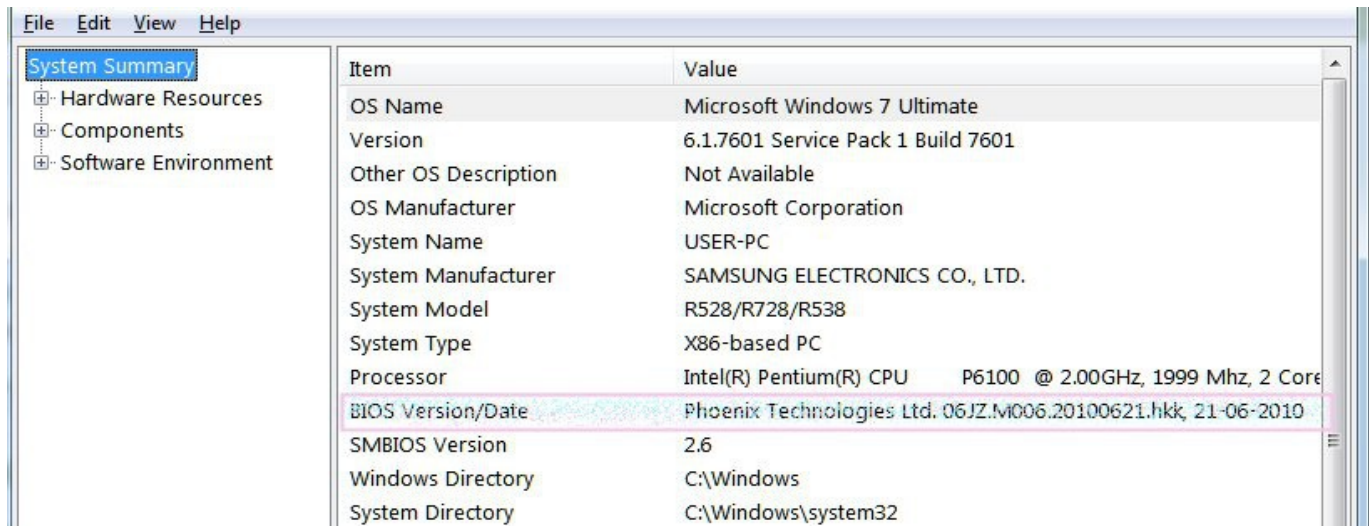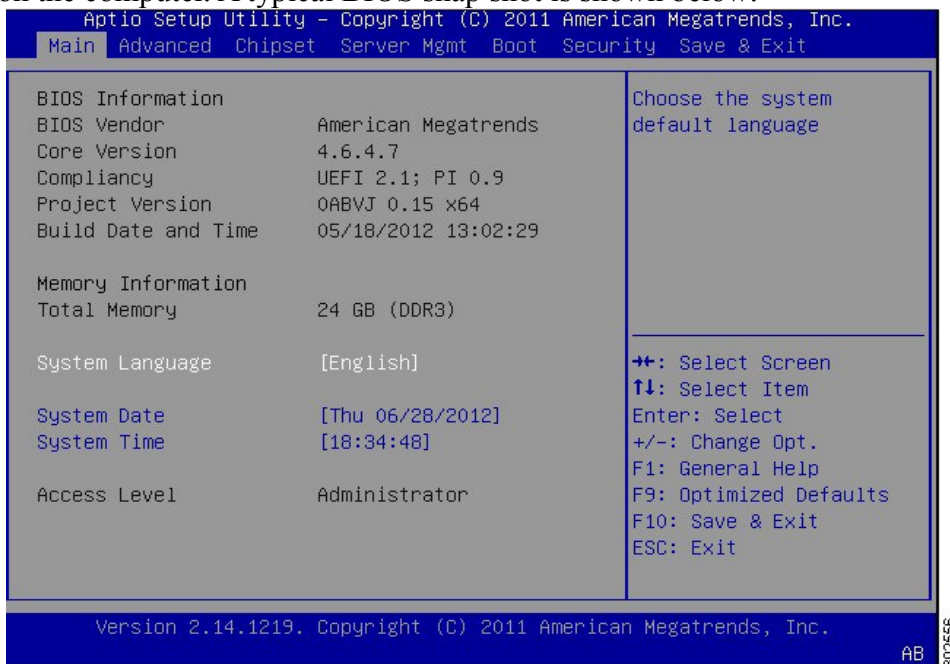# 1. PC Hardware

1.1 Configure and apply BIOS settings:

1.1.1

You may find the BIOS version on a Windows computer by running msinfo32 command at the command prompt. It will bring up the following window:

As can be seen in the above screenshot, BIOS info is given under System Summary. BIOS has a Setup utility stored in the BIOS flash memory. The configured data is provided with context-sensitive Help and is stored in the system's battery-backed CMOS RAM. To get into the BIOS on your Windows computer you need to press F2 just after you turn on the computer. A typical BIOS snap shot is shown below:

A+ Essentials Exam Sim   A+ Practical Exam Sim   Network+ Exam Sim   Security+ Exam Sim   Server+ Exam Sim

1. The following are some of the things that you can do with BIOS settings:

   a) Change the Boot Order – You may configure the computer to boot from CDROM, Harddisk, or USB drive.
   b) Create a BIOS Password – This feature is useful to prevent un-authorized access to BIOS configuration menu.
   c) Change the Date and Time
   d) Change Floppy Drive, Hard Drive, or CD/DVD/BD Drive Settings.
   e) View Amount of Memory Installed
   f) Enable or Disable the Quick Power On Self Test (POST)
   g) Enable or Disable the CPU Internal Cache
   h) Enable or Disable the Caching of BIOS
   i) Change CPU Settings
   j) Change Memory Settings
   k) Change System Voltages
   l) Enable or Disable RAID
   m) Enable or Disable Onboard USB
   n) Enable or Disable Onboard IEEE1394
   o) Enable or Disable Onboard Audio
   p) Enable or Disable Onboard Floppy Controller
   q) Enable or Disable Onboard Serial/Parallel Ports
   r) Enable or Disable ACPI
   s) Change the Power Button Function
   t) Change Power-on Settings
   u) Change Fan Speed Settings

2. The computer power-on self-test (POST) tests the computer to make sure it meets the necessary system requirements and that all hardware is working properly before starting the remainder of the boot process. The causes for an error message like: 'NTLDR is Missing, Press any key to restart', may be due to any of the following reasons:
   a. Computer is booting from a non-bootable source.
   b. Computer hard disk drive is not properly setup in BIOS.
   c. Corrupt NTLDR and/or NTDETECT.COM file.
   d. Attempting to upgrade from a Windows 95, 98, or ME computer that is using FAT32.
   e. Corrupt boot sector / master boot record.
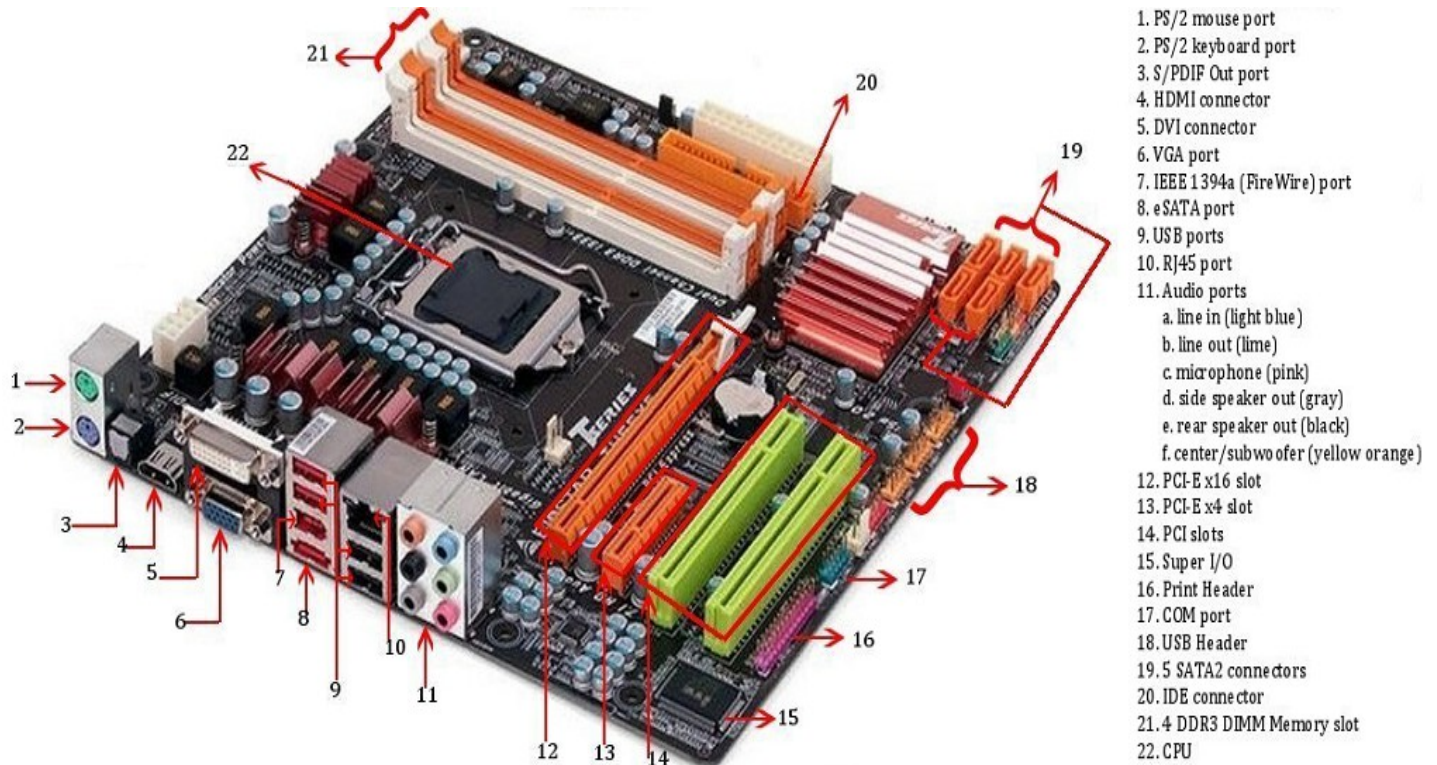   f. Loose or Faulty IDE/EIDE hard disk drive cable.

1.2 Differentiate between motherboard components, their purposes, and properties

ATX (Advanced Technology Extended) is a full size board measuring 12" wide by 9.6" deep. ATX has 6-pin mini keyboard connector. Also, it has double row single power supply connector providing +/-5V, +/-12V, and +3.3V.

MicroATX is a small motherboard size of 9.6" x 9.6". Compared to full size ATX, microATX have smaller number of I/O slots. For example, full ATX can have 5 PCI slots, whereas MicroATX can have up to 3/4 PCI stots only. The chief advantages over ATX is reduced size, and power requirements.

Components

A typical Micro ATX motherboard with constituent components is given below:

1. PS/2 mouse port
2. PS/2 keyboard port
3. S/PDIF Out port
4. HDMI connector
5. DVI connector
6. VGA port
7. IEEE 1394a (FireWire) port
8. eSATA port
9. USB ports
10. RJ45 port
11. Audio ports
   a. line in (light blue)
   b. line out (lime)
   c. microphone (pink)
   d. side speaker out (gray)
   e. rear speaker out (black)
   f. center/subwoofer (yellow orange)
12. PCI-E x16 slot
13. PCI-E x4 slot
14. PCI slots
15. Super I/O
16. Print Header
17. COM port
18. USB Header
19. 5 SATA2 connectors
20. IDE connector
21. 4 DDR3 DIMM Memory slot
22. CPU

MicroATX motherboard

1. PS/2 mouse port (green). This port is for a PS/2 mouse.

2. PS/2 keyboard port (purple). This port is for a PS/2 keyboard.

3. S/PDIF Outport: It stands for Sony/Phillips Digital Interface, and is an interface to transmit digital audio.

4. HDMI connector: Stands for "High-Definition Multimedia Interface." HDMI is a digital interface for transmitting audio and video data in a single cable. It is supported by most HDTVs and related components, such as DVD and Blu-ray players, cable boxes, and video game systems.

5. DVI (Digital Visual Interface) connector: It is used to send digital information from a computer to a digital display, such as a flat-panel LCD monitor.

6. VGA connector (Video Graphics Array) :VGA cables carry an analog signal as opposed to a digital signal (ones and zeroes). Using higher frequencies, it's possible to reach a relatively high range of video resolutions. However, video quality directly responds to cable quality, and doubly so on higher resolutions. Due to this, the quality of a VGA image can variate notable across different makes of cables.

7.Firewire header (IEEE 1394): A serial bus used to exchange digital and audio data with high performance

abilities.

8. eSATA (External Serial Advanced Technology Attachment): It is an external interface for SATA technologies. It competes with FireWire 400 and universal serial bus (USB) 2.0 to provide fast data transfer speeds for external storage devices.

9. USB (Universal Serial Bus) Port: There are usually a couple of these ports located on each motherboard used for connecting pen drives and external hard drives, like Ipods or Mp3 players.

10. RJ-45 (Registered Jack 45): It is commonly used for an Ethernet or serial connection with an 8 position 8 conductor (8P8C) jack.

11. Audio ports:

    a. Line In port (light blue). This port connects a tape, CD, DVD player or other audio sources.

    b. Line Out port (lime). This port connects a headphone or a speaker. In 4-channel, 6-channel, and 8-channel mode, the function of this port becomes Front Speaker Out.

    c. Microphone port (pink). This port connects a microphone.

    d. Side Speaker Out port (gray). This port connects to the side speakers in an 8-channel audio configuration.

    e. Rear Speaker Out port (black). This port connects to the rear speakers on a 4-channel, 6-channel, or 8-channel audio configuration.

    f. Center/Subwoofer port (yellow orange). This port connects the center/subwoofer speakers.

12. PCI Express x16 graphics interface offers increased bandwidth and scalability over the previous AGP8X generation. PCI Express x16 allows up to 4 GB/s of peak bandwidth per direction, and up to 8 GB/s concurrent bandwidth.

13. PCI Express x4 graphics interface allows up to 800 MB/s of peak bandwidth per direction.

14. PCI (Peripheral Component Interconnect) Slot: Supports peripherals like sound cards, DVD decoders, and graphic accelerators with 32 bits at 33Mhz capabilities. There are usually anywhere from 1 to 6 PCI slots available on the motherboard.

15. Printer Header: It is parallel port used to connect scanners and printers.

16. COM (Communication) Port: The port designed to connect your mouse and modem.

17. IDE Connector: Responsible for connecting the IDE cord used for hard disks, CD drives, and DVD drives.

18. CPU slot: To install the CPU, just slide it straight down into the slot. Special notches in the slot make it impossible to install them incorrectly. So remember if it does not go easily, it is probably not correct. Be sure to plug in the CPU fan's power.

19. SATA Controller: Motherboard will typically have SATA controller for connecting SATA enabled devices such as Hard disks.